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THE USE OF A SOLUBLE ANTIGEN OF 'RICKETTSSIA  
BURNETI' AS AN ALLERGEN FOR DIAGNOSIS OF  
FRESH CASES OF Q-FEVER IN MAN

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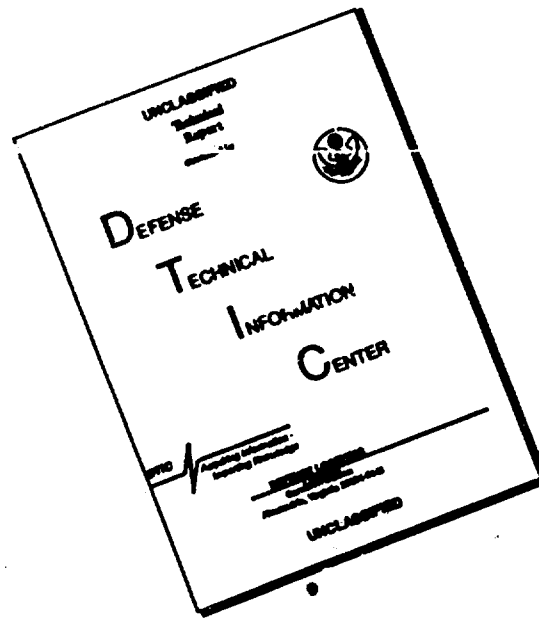
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 FOR DIAGNOSIS OF FRESH CASES OF Q-FEVER IN MAN

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A study was made of the diagnostic value of a soluble Rickettsia burneti antigen for diagnosis of fresh cases of Q-fever in man. In examining 32 patients it was established that intracutaneous test with a soluble antigen became positive from the 5th day of the disease. The maximum rise of this reaction was noted in a majority of the patients by the end of the 24 hours, and then it declined. Soluble antigen injected intracutaneously (0.1 ml) provoked not allergization of the organism or formation of complement fixation antibodies.

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 FEVER IN MAN

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In a previous report (Kudelina and Kambaratov, 1969) we demonstrated that the soluble antigen obtained from Rickettsia burneti phase I according to Buaven's method can be used for retrospective diagnosis of Q-fever in man. In this report an attempt will be made to show the diagnostic value of a soluble antigen for detection of mild cases of Q-fever.

Comparative results of intracutaneous tests and  
 the complement fixation reaction in Q-fever  
 patients

Day after start of disease	Number of patients	Intracutaneous test		Complement fix- ation reaction	
		pos- itive	neg- ative	pos- itive	neg- ative
5-7th	5	5	-	-	5
8-14th	16	12	4	7	9
15-24th	11	7	4	8	3
Total	32	24	8	15	17

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Intracutaneous testing with soluble antigen was conducted on 32 Q-fever patients ranging in age from 6 to 55 (26 males and 6 females). The tests were carried out between the 5th and 24th days after the disease began. Two patients had light cases, 28 average, and 2 severe. During the first week of the disease the complement fixation reaction was negative for all 5 patients examined, while the intracutaneous test turned out positive in every case (table). During the second week the intracutaneous test was positive for 12 of 16 patients, while the complement fixation reaction was positive only for 7. During the third and fourth weeks, the results of intracutaneous tests and serological reaction agreed. The lower number of positive results of the complement fixation reaction during the first and second weeks explains why the complement fixation antibodies were detected in the blood of the patients from the third week. During our observation of 247 patients antibodies were observed in 10.6% during the first week, 58.3% during the second, 85.7% during the third, and 97.2% during the fourth. The intracutaneous test was positive in light cases only 24 hours after antigen injection for the majority of the patients, while after 48 hours, it had begun to decline. Normally by the 4th to 7th day no sign remained at the point of antigen injection. Patients' case histories are given for illustration.

Bol'noy D., 25 years, carpenter in furniture factory. Fell ill on 4/18/70. Admitted to a hospital for infectious diseases with grip diagnosed on 4/20. Fever lasted 15 days, temperature reaching 40.2°C. From the 4th day of the illness his liver and spleen were palpated. An average case of Q-fever was diagnosed on the basis of clinical and serological data. Intracutaneous testing with soluble antigen on the 7th day of the disease was positive: after 24 hours hyperemia and infiltrate with dimensions of 1x1 cm, after 48 hours papula with dimensions of 0.5x0.5 cm. The complement fixation reaction was negative on the 5th and 11th days; positive with a phase II antigen in a 1:80 (+++) titer but negative with a phase I antigen on the 18th; positive with a phase II antigen in a 1:320 (+++) titer but negative with a phase I antigen on the 26th day.

Bol'noy V., 16, student. Fell ill on 6/24/69. Admitted to hospital of infectious diseases for observation on 6/12. Fever lasted 9 days, temperature reaching 40°C. Liver and spleen were palpated. Intracutaneous testing with a solution of Rickettsia burneti antigen on the 11th day of the disease was positive: hyperemia and infiltrate after 24 hours up to 1x1.5 cm, after 48 hours up to 1x1 cm papules in the center along with hyperemia and infiltrate. The complement fixation reactions on the 14th and 21st days of the disease were negative. On the basis of the clinical period of the disease and the positive intracutaneous tests, Q-fever of average intensity was diagnosed on the 22nd day. The diagnosis was supported by a serological investigation:

on the 42nd day the complement fixation reaction with the phase II antigen was positive in a 1:160 (++) titer and negative with the phase I antigen.

Soluble antigen intracutaneously injected in a 0.1 ml quantity caused no formation of complement fixation antibodies or allergization of the organism. Fifteen men with various diseases (Brill's disease - 1, typhoid - 3, Botkin's disease - 5, acute brucellosis - 2, leptospirosis - 2, hemorrhagic fever with renal syndrome - 1, acute respiratory illness - 1) served as the control. Intracutaneous injections of soluble antigen repeated throughout a 7-18 day period caused no positive allergic reaction. The complement fixation reaction remained negative after the initial and even supplemental antigen injections. The history of one patient is presented as an example.

Bol'naya P., 16, student. Fell ill on 3/29/70. Admitted to hospital for infectious diseases with a diagnosis of grip on 4/2. On the basis of epidemiological and clinical data, hemorrhagic fever with renal syndrome was diagnosed. Intracutaneous tests with soluble burneti antigen on the 10th and 16th days of the disease were negative. The complement fixation reactions with Rickettsia burneti antigens on the 10th, 16th, 24th, and 31st days were negative.

From this information it is clear that intracutaneous allergic testing with soluble antigen is a valuable method of diagnosing light cases of Q-fever in man.

### Conclusions.

1. Intracutaneous testing with soluble antigen became positive for patients with Q-fever from the 5th day of the disease, with the maximum reaction in light cases after 24 hours for the majority of the patients and decline beginning by the end of the second day.

2. Soluble antigen injected intracutaneously (0.1 ml) caused neither allergization of the organism nor formation of complement fixation antibodies.

3. Soluble antigen can be recommended as a diagnostic tool for detecting new cases of Q-fever.

Reference Kudelina, R.I. and Kambaratov P.I. Journal of Microbiology (Zh. mikrobiol.), 1969, No. 9, p.81.